RESULTS IN ABDOMINAL WALL SUTURE.[1]

BY CHARLES DAVISON, M.D.,

OF CHICAGO.

AFTER a laparotomy, the abdominal wound to be ideal must be neat in appearance, accurate in apposition of tissue, sterile in healing, and strong in the resulting scar.

Some time ago the writer proposed the fastening of a longitudinal silkworm-gut suture in the fascia of the abdominal wall by terminal bow-knots, leaving the ends of the suture protruding from the wound. The knots to be untied by traction on the exposed ends and the suture removed at the completion of the process of healing.

A complete series of forty-one consecutive cases with sterile primary union was reported at that time.[1]

The aim of this simple manipulation was to obtain all of the advantages and security of close and accurate suture of the individual layers of the abdominal wall without the danger of suppuration incident to the use of catgut and its pulpification and absorption, and without the dangers of irritation and sinus following the use of any permanent buried suture. Silkworm gut can be made absolutely sterile; it can be boiled in water any length of time without injury; its texture is practically impervious to the entrance of germs; and it does not in itself furnish a culture medium for the growth of pyogenic bacteria.

Silkworm gut can be removed after any method of longitudinal suture in which the perforations in the fascia practically assume a straight line when traction is made on the suture.

If a form of suture is used which surrounds tissue, as the glover's or over-and-over stitch, it will bind, and be difficult or impossible to remove it.

Model "A" shows the method of application of a fastened longitudinal herring-bone suture of the linea alba, which produces edge-to-edge approximation of the cut fascia.

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Model " B" shows the method of application of a fastened basting suture, which produces a flap approximation of tissue, applicable to the Bassini operation for inguinal hernia or to the Mayo operation for umbilical hernia.

The aim of every surgeon is to close his laparotomy wound in such a manner that he will get (1) Sterile healing of the wound, (2) close and accurate union of the strong fascia, (3) no postoperative ventral hernias.

The ultimate object is to obtain a scar so well placed and so strong as to prevent postoperative ventral hernia as long as the patient may live.

It is along these lines that methods should be compared.

1. *Sterility.*—Abel's analysis of the cases occurring in the Leipzig Gynæcological Clinic for four years shows 280 cases of catgut fascia suture with fifty-two infections, or 18 per cent. of infections.[2]

The writer has used the tied longitudinal silkworm-gut suture in all clean laparotomies during the three years 1901–3.

The results are as follows: One hundred and seventy-eight cases with seven infections, or less than 4 per cent. of infections.

Of these cases, twenty-three were emergencies, operated upon without previous preparation, with four cases showing infection, all limited to the subcutaneous fat.

The remaining 155 cases had hospital preparation previous to the operation, with three cases of infection, or less than 2 per cent. of suppuration in the prepared cases.

The reports by Haggard,[3] Bell,[4] Hamilton,[5] and others sustain the position that the use of a removable buried silkworm-gut suture lessens the danger of abdominal wound suppuration.

2. *Approximation of Fascia.*—After the process of cicatrization has been completed, a close union of the fascia by a minimum amount of scar tissue, with no interposition of peritoneum muscle or fat, is the ideal prophylactic against post-operation ventral hernia. In one of my cases a secondary laparotomy was required. The fascial stitch was allowed to

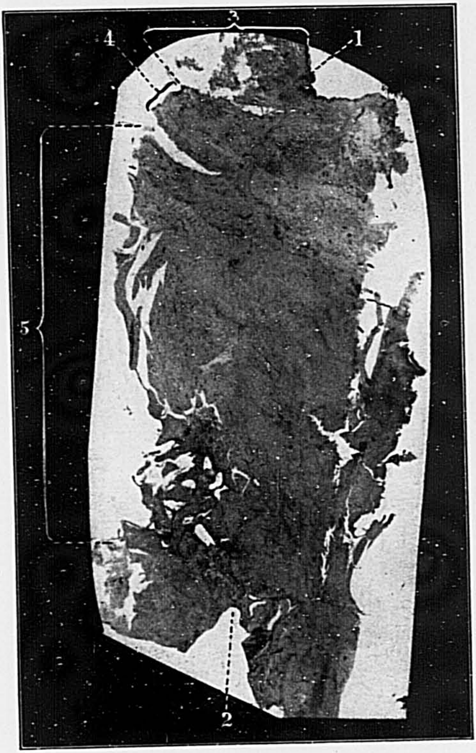

FIG. 1.—Cross-section of scar three weeks after operation; magnified four diameters. 1. Skin incision. 2. Peritoneal incision; scar line between 1 and 2. 3. Skin and subcutaneous fat. 4. Fascia over rectus muscle. 5. Rectus muscle.

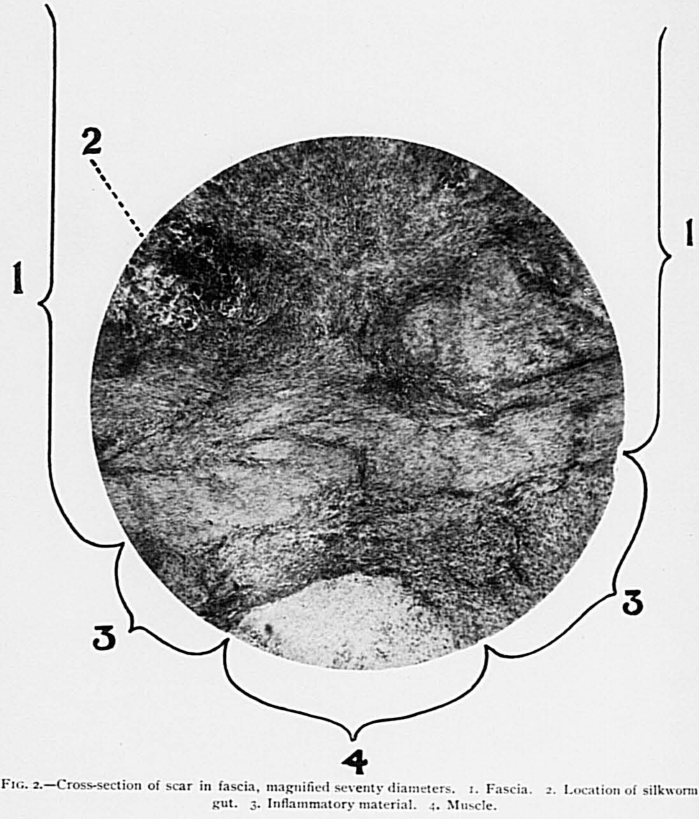

FIG. 2.—Cross-section of scar in fascia, magnified seventy diameters. 1. Fascia. 2. Location of silkworm gut. 3. Inflammatory material. 4. Muscle.

remain three weeks, when the entire scar containing the stitch was dissected out. Cross-sections of the scar for microscopical examination were made by Professor W. A. Evans and microphotographs by Dr. Gramm.

The laparotomy wound was made through the right rectus muscle and the tied suture was in the fascia covering the muscle.

Microphotographs (Figs. 1 and 2) show for themselves the closeness of the union of the fascia and the small amount of inflammatory tissue present.

3. *Postoperative Ventral Hernia.*—Freedom from postoperative ventral hernia is the final test of all methods of abdominal suture. Probably the most accurate comparative statistics that we have on the subject are those compiled by Abel.[2]

Abel concludes that hernia is not due to conditions of the abdominal wall, but depends on the closeness of union of the fascia and the manner of healing of the wound. According to Abel's tables, fewer hernias followed fascial suture by catgut than by any other method of abdominal wound closure in use at that clinic. He gives 224 clean cases followed by twenty hernias, or 8.9 per cent., and fifty-two infected cases followed by sixteen hernias, or 31 per cent. A total of 276 cases of fascial catgut suture followed by thirty-six hernias, or 13 per cent. The best showing was made by cumol catgut with fifty cases followed by three hernias, or 6 per cent. Of the writer's 178 cases of removable silkworm-gut suture, 131 have been followed up to the time of the preparation of this report. One case of spontaneous epigastric hernia operated upon by Mayo's method had a recurrence of hernia two inches from the old line of incision five months after operation.

Three-fourths of 1 per cent. of postoperative ventral hernias.

REFERENCES.

[1] ANNALS OF SURGERY, March, 1902.
[2] Progressive Medicine, June, 1899.
[3] American Medicine, February 7, 1903.
[4] Journal of Obstetrics, Gynæcology, and Pædiatrics, 1903.
[5] Western Medical Review, September 15, 1903. Therapeutic Gazette, January 15, 1904.